Feasibility and Acceptability of Qigong Exercise in Community-Dwelling Older Adults

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Abstract

Objectives: Qigong exercise has been shown to improve physical and psychological well-being in adults with chronic conditions, but little is known about the feasibility and acceptability of engaging in a Qigong exercise program in community-dwelling older adults in the United States. The purpose of this study was to explore the feasibility, acceptance, and adherence to an 8-week Qigong exercise intervention in community-dwelling American older adults.

Design: An exploratory study design.

Setting: Two senior centers in southern Connecticut.

Subjects: 45 community-dwelling older adults aged 65 to 85 years enrolled.

Intervention: A supervised 1-hour Health Qigong exercise session twice weekly for 8 weeks.

Outcome Measures: An investigator-designed questionnaire with 7 items that were rated on a 1 to 6 scale, with higher scores indicating better results and 9 open-ended questions were used to obtain data on feasibility and acceptability. Adherence was calculated as the proportion of the 16 planned sessions attended.

Results: Of the 45 older adults enrolled, 6 never started and 6 withdrew, with 33 evaluable at the end of the intervention. The mean age of the sample was 74.8 years; the majority were female (84.4%) and white (91.1%). Mean scores on aspects of difficulty, acceptability, suitability, or effectiveness of Qigong exercise were all ≥5. Participants identified benefits of Qigong exercise, such as calming and relaxing feelings, inner peace, better balance, and flexibility. Attendance rate was 78.8%, with 94% performing Qigong exercise at least once weekly outside the class. All participants indicated that they would recommend Qigong exercise to others. No adverse events occurred.

Conclusion: An 8-week Qigong exercise program was feasible, acceptable, and safe for American older adults. Future robust randomized controlled trials are needed to confirm our findings.

INTRODUCTION

Healthy aging is the public health goal for older adults. The primary goals of healthy aging are to reduce functional limitations, preserve quality of life, and maintain independent living.[1] Exercise improves older adults' strength, endurance, flexibility and balance.[2] Regular physical activity is associated with improved survival, contributes to the preservation of functional ability and helps to defer physical disability.[3,4] Even sedentary older adults who become physically active later in life can gain significant health benefits from physical activity.[5]

Older adults need exercise programs that correspond to age-related changes.[6] Chinese traditional medicine exercise, such as Qigong and Tai chi, is a gentle low-impact mind-body exercise and can be performed by people of all ages.[7] Both exercises are based on the theory that the body is a small universe where "Qi", a vital energy, circulates. Illness or injury disturbs the harmony of vital energy circulation. Qigong exercise is believed to be a method of bringing vital energy flow into balance through meditation, breathing exercise, and body movements.[8] Although Tai chi and Qigong exercise share a mutual theory, Qigong exercise emphasizes self-healing by cultivating vital energy internally;[9] whereas Tai chi has more and complex movements that are designed for physical fitness and self-defense. The application of Tai chi and Qigong exercise to community-dwelling older adults to promote their general health has been recommended.[10,11] Yet, most research addressing the benefits of Qigong exercise on balance, muscle strength, psychological health, and quality of life was not conducted in American older adults.[11]

Despite evidence of the benefits of Qigong exercise interventions, no study was found that comprehensively addressed the feasibility and acceptability in community-dwelling American older adults. The purpose of this study was to explore the feasibility, acceptability and

adherence of an 8-week Qigong exercise program in community-dwelling older adults in the United States.

METHODS

Study Design

The primary goal of the present study was to explore the feasibility, acceptability, and adherence of an 8-week Health Qigong (Baduanjin) exercise intervention in healthy community-dwelling older adults and their perception of Qigong exercise. A one-group pretest and posttest study was used; data were collected at baseline and at 8 weeks post-intervention.

Ethical Consideration

The study protocol was approved by the Yale University Human Investigation Committee. Written informed consent from participants was obtained.

Participants and Setting

Recruitment was conducted in two senior centers in southern Connecticut from April to August of 2015. Because chronological age does not usually reflect physical age of older adults, a criterion was set for baseline 6-minute walk test (6MWT) to exclude older adults who were too physically fit. The cut-off point for the 6MWT was obtained from an Australia study.[12] Eligibility criteria were: age 65-85 years; English speaking; stable medical condition with a primary care provider's permission to participate; a baseline 6MWT less than 554 meters for males and 530 meters for females; a Mini-Mental State Examination score of at least 25; and no severe bone, joint or other health conditions that would limit exercise training. Exclusion criteria were participation in Tai chi or Qigong classes in the last 6 months, baseline performance of more than 240 minutes of moderate-intensity exercise (i.e., activities that are more strenuous

than walking but less strenuous than running) weekly, use of an assistive device (i.e., walkers, canes, and wheelchairs), or inability to give informed consent.

Flyers were used to recruit participants at the two senior centers, and the principal investigator (P. Chang) visited the centers weekly. Interested people could contact the principal investigator by email or telephone and establish an appointment for eligibility screening. Eligible older adults were given a consent form and demographic and baseline data were collected.

Sample Size Determination and Statistical Power

Sample size calculations were done using G*Power 3.1. Calculations were based on a one-group repeated measures design using a paired t-test, assuming 80% power, alpha of 0.05, effect size of 0.53 and 2-tailed test for statistical significance. The effect size was obtained from a previous Qigong study using the 6MWT as the outcome measure.[13] The sample size needed to detect a significant difference in changes in physical ability was 31. Forty-five subjects were enrolled to allow for attrition, 31 from the Milford Senior Center and 14 from the Orange Senior Center.

Qigong Intervention

Participants were given the schedule of the Qigong sessions and a date to start. Primary care providers were contacted to obtain permission for participation. When the number of enrolled older adults reached approximately 10, the Qigong intervention class commenced. An experienced Qigong practitioner, who was verified by a Qigong master for eligibility to teach, was employed to lead the Qigong exercise classes. Each session was conducted with musical accompaniment. The Health Qigong program (Baduanjin) included breathing exercise guided by 8 gentle upper and lower body movements and meditation (Figure 1). The participants performed movements in a standing position within their comfort zone. Each session began with warm-up

exercises for 5-10 minutes, followed by 40-minute Health Qigong exercise, and concluded with 5-10 minutes of relaxation. Participants were asked to attend the session twice weekly for 8 weeks for a total of 16 Qigong sessions, and were encouraged to practice Qigong exercise outside of the class using a video that was provided. Participants were also asked to record their exercise outside of the class weekly using an exercise diary. Direct observation of randomly selected sessions and the number of classes and hours taught were documented to assess intervention fidelity.

Outcome Measures

Feasibility and acceptability were evaluated by participant feedback, which was obtained by an investigator-designed questionnaire. The questionnaire was reviewed by three experienced researchers and revised. Seven questions were related to the participants' perceptions and practice experiences with the 8-week Qigong program and were rated on a scale of 1 to 6, with 6 indicating greater ease, acceptability, suitability, or effectiveness. Nine open-ended questions explored beliefs and experiences, perceived satisfaction, barriers and benefits of Qigong exercise (Table 1). Adherence was calculated by the number of actual participated sessions divided by the number of total sessions and the proportion of participants who practiced it at home.

RESULTS

A total of 45 older adults were enrolled into 3 separate Qigong exercise groups. Six never started and 2 participants dropped out at week 1, 2 at week 2, and 2 at week 5, leaving 33 participants evaluable at the end of the intervention (84.6% retention). There were no significant differences on demographic characteristics, physical activity, health characteristics, or baseline outcome measurements between those who dropped out and those who remained in the study.

The mean age of participants was 74.8±6.57 years (range 65 to 86 years); the majority were retired (91.0%), white (91.1%), female (84.4%), and had at least a college-level education (64.4%). A history of hypertension (37.8%) and osteoarthritis (35.6%) were the most common chronic conditions (Table 2). The preliminary efficacy of Health Qigong on physical and psychological health and spiritual well-being will be published elsewhere (in review).[14]

Feasibility and Acceptability of Qigong Exercise

Participants rated the difficulty, acceptability, suitability, or effectiveness of Qigong on a scale of 1 to 6, with higher scores indicating better results (Table 3). The mean rating on all items was at least 5.0. The mean score on side effects of Qigong exercise was 5.7 (6 indicated no side-effects). All participants could follow the instructor to complete 8 Qigong movements by the fourth week of the intervention. Most participants indicated that the pace of the class was adequate and mirrors in the classroom were perceived as very helpful for them to adjust their movements. Most participants reported that the instructor provided concise and clear instructions, wisely used the class time, and took their physical ability or limitations into account.

Participants reported that practicing Qigong exercise at home was easy with the average rating of 4 on a scale of 1 to 6. Most participants indicated that practicing Qigong exercise was not time consuming and could be easily accommodated into their daily schedule. The Qigong exercise video and instruction facilitated practicing Qigong at home. The most common barriers to doing Qigong exercise at home were lack of self-discipline, difficulty in remembering the movements and sequences of Qigong exercise, and lack of time.

Qualitatively, participants reported Qigong exercise as acceptable and identified perceived benefits to practice, such as calming and relaxing feelings, inner peace, better balance,

and flexibility. They indicated “feeling great after each class” and there was a general feeling that “Qigong exercise is more than what it seems” because of perceived physical and psychological benefits. One participant stated that “I am sure it (Qigong exercise) lowered my blood pressure”, which suggests that participants accepted this exercise and recognized its potential for health promotion. Additionally, every participant reported that they would recommend Qigong exercise to others. No adverse events occurred during the study.

Adherence to Qigong Exercise

The participants who completed the study attended 78.8% of the sessions (average 12.6 of 16). The most common reasons for missing sessions were holiday travel, babysitting grandchildren, and doctor appointments. Approximately 94% performed Qigong exercise at least once a week outside the class, with 53% reporting once, 19% twice, and 22% reporting more than three times. Participants reported that the beneficial effects of Qigong exercise contributed to their adherence at home. Participants stated that Qigong exercise brought them a feeling of calm and accomplishment, and they used meditation to calm themselves when facing other stressful events in their life.

Nearly all of the participants indicated they would continue practicing Qigong exercise after the study because they wanted to maintain the benefits gained from the exercise. Qigong exercise was easily integrated into everyday life and they enjoyed it.

DISCUSSION

Qigong, consisting of gentle exercise and meditation with breathing exercise, has been practiced for more than 2,000 years in Eastern countries. It has been considered as one of the safe lifestyle therapeutic exercises that can apply to all age groups. Numerous studies conducted with Qigong exercise have shown that it can improve the physical and psychological well-being of Chinese adults with chronic conditions.[11] Qigong exercise is relatively new to Western

countries. Although a pilot studies evaluated its feasibility and safety in American older prostate cancer survivors[15], no study was found that comprehensively evaluated the feasibility and acceptability of Qigong exercise in community-dwelling American older adults.

We found that the 8-week Health Qigong intervention for older adults was feasible and acceptable. The retention, adherence in class and at home practice were 84.6%, 78.8%, 94%, respectively. Although, few participants reported some physical challenges with the Qigong exercises at the beginning of the program, they subsided as the program progressed.

Dosage of Qigong interventions varies among the existing studies. There was no consensus on the length of Qigong interventions. The range of intervention duration was from 4 days to 12 months.[15,16] An 8-week intervention was employed in the present study, given that several studies used interventions that were 8 weeks long or less and were still able to detect significant changes,[15,17-21] and this study's purpose was to explore the feasibility and preliminary efficacy of Health Qigong in community-dwelling older adults. The findings of the present study demonstrated that the 8-week intervention was effective in promoting physical and psychological health of older adults.[14] Additionally, study participants reported that 1-hour, twice weekly sessions for 8 weeks were feasible for their schedules and they were able to perceive physical, mental and spiritual benefits (Table 3). Future research can test if a shorter Qigong intervention is effective.

Various forms of Qigong exercises have been investigated in China, including Baduanjin, Yi Jin Jing and Wu Qin Xi.[11] Each exercise has different numbers and types of body movements. Despite the variation in movements, Baduanjin, Yi Jin Jing and Wu Qin Xi share many components, including weight shifting between lower extremities, standing position with bended knees (horse stand), stretches of upper body, meditation and breathing exercise. However, Yi Jin

Jing and Wu Qin Xin involve movements, such as one-leg stand without supports, that would be challenging for older adults with physical limitations to perform. Thus, Baduanjin, also called Health Qigong, was used in the present study after consulting with a Qigong master and taking participants' physical ability and ages into account. Baduanjin is for beginners and is easy to learn and perform without any challenging movements. Moreover, the feedback from the participants enrolled in the present study confirmed that Bajuanjin was feasible and physically acceptable for their physical ability, and participants reported no critical barriers to learn or perform this exercise.

The acceptance and perceived benefits of Qigong intervention were high (Table 3), which is similar to findings of previous studies conducted in patients with cancer [22,23] and diabetes.[24] A 12-week Qigong intervention (n=20) was compared to a stretching exercise group (n=20) in older men with prostate cancer (median age: 72 years).[22] The Qigong group retention rate was 80% and the adherence rate was 85%, which are higher than the stretching exercise group and are similar to our findings. A beneficial effect of Qigong was also noted, with improvements in fatigue and distress. In a non-cancer population, the retention rate for the Qigong intervention (92%) was higher[24]; however, the exercise adherence rate outside the class (78%) was lower than our study (94%). It is possible that the supervised instruction of the Qigong exercise class and the video given to the study participants supported or motivated participants to practice at home.

The attendance rate in our study (78.8%) was similar to previous Tai chi and Qigong studies, which have ranged from 74% to 100%.[25-27] The moderate attendance rate of participants was not due to loss of interest, but rather doctor appointments and family obligations. All subjects were recruited from senior centers and many were retired and remained functionally active in their families. They were often forced to miss the class for babysitting their

grandchildren, taking their spouse to doctor appointments, or needing immediate medical attention due to their own chronic conditions. Possible approaches to these issues that we learned from our study include giving the participants the class schedule 1 or 2 months before the class begins and avoiding having classes when there is no school in the summer.

The present study also revealed that the perceived beneficial effects contributed to participant adherence. Only one study suggested that positive views of Qigong exercise might be associated with better participation and compliance with Qigong exercise.[28] Moreover, as previous research revealed the potential implication of spirituality in meditative movement including Qigong,[29,30] the results of our study also suggests that spirituality may be another crucial factor that can potentially influence Qigong exercise adherence and acceptance in older adults, as well as have a positive impact on physical and psychological well-being.[14]

Implications for Future Research

Several recommendations that are derived from the findings of the present study are made for future Qigong studies to enhance retention, adherence, home practice and acceptance. First, the design of intervention should take participants' physical ability into account and carefully consider the frequency of classes per week, appropriate session length with break time, intensity (mild to moderate), and posture choice (standing, siting, lying down or mixed). Second, our findings demonstrate the importance of the development of educational resources (brochure, instruction and video) for participants. These resources were found helpful in supporting participants' exercise adherence at home. Third, our study shows that it is valuable to have an experienced Qigong instructor to lead and teach Qigong exercise. The instructor's previous experience was found helpful in clarifying and answering participants' questions related to the theoretical underpinnings of Qigong or body movements, which may increase participants'

retention, attendance, and satisfaction with the intervention. Further, medical knowledge was found not to be an essential element for a Qigong instructor in the study; instead, awareness of participants' physical limitations is necessary while conducting and leading exercise sessions. Lastly, the priority classroom selection should be based on availability of private and public transportation or free parking, which may increase participants' willingness to attend classes. The relaxed classroom environment with features such as quiet, a green environment, and music, not only encouraged participants to follow the instructions easily and correctly, but also facilitated meditation practice. Most importantly, the classroom should be equipped with mirrors that facilitate participants adjusting their movements.

Strength and Limitations

The strength of this study is that, to our knowledge, it is the first to comprehensively evaluate the feasibility and acceptability of Qigong exercise in a US older population.

The study was limited by the small sample size and lack of control for other exercise. In addition, the video was given to encourage practicing at home, with 94% reporting practicing Health Qigong at least once a week, which results in the inconsistent intervention intensity across participants. Although the participants were asked to record and return exercise diaries weekly, the return rate was low and the analysis of the connection between the dosage of Qigong exercise and improved outcomes was unable to be accomplished. Despite the inconsistent intervention intensity, the high exercise adherence rate outside the class shows the promising application of Health Qigong exercise to promote physical activity in community-dwelling older adults. Further, the retention rate of our study was consistent with previous studies, but could be improved in the future. Among the six participants who dropped out after the intervention began,

only two withdrew because of no interest in practicing Qigong exercise and schedule conflicts. The remaining four participants withdrew due to medical illness.

Findings of the present study suggest that Qigong exercise for older adults is feasible, acceptable and safe, which highlights the implication of Qigong exercise to promote regular physical activity in older adults. We suggest that senior centers offer Qigong exercise classes to promote overall health and fitness of community-dwelling older adults. Although our study found Qigong feasible and safe for an older population, more research is needed to confirm the health benefits of Qigong in older persons, especially those with common chronic illnesses, such as hypertension, arthritis, and cardiovascular disease.

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Conflict of Interest:

The authors have no conflicts of interest to declare.

Author Contributions:

PC, MTK, and MF contributed to the conception and design of this study and data analysis. PC recruited participants and conducted study. BO contributed to the design of this study. All authors were involved in writing and revising the manuscript and approved the final manuscript.

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No competing financial interests exist.

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